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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/784,626	02/14/2001	Daniel I. Some	49959-145	3092

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APPLIED MATERIALS, INC.
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EXAMINER

SONG, HOON K

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 03/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/784,626

Applicant(s)

SOME ET AL.

Examiner

Hoon K Song

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 9-16, 20-25 and 28-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Ross et al. (US 4532430)

Regarding claims 1, 21-22, Ross teaches an apparatus for inspecting a surface of an article, the apparatus comprising:

a light source (44) for irradiating a portion of the surface of the article with a light beam at an incident wavelength;

a first detector (33) for receiving light at the incident wavelength from the portion of the surface and generating a first signal;

a second detector (33") for receiving light at a wavelength different from the incident wavelength from the portion of the surface and generating a second signal; and

a processor configured for determining, based on the first and second signals, whether a defect exists on the portion of the surface (column 8 line 28+).

Regarding claim 2, Ross teaches that the light source is a laser for producing laser light at the incident wavelength (column 8 line 28+).

Regarding claim 3, Ross teaches that the laser provides continuous wave laser light or modelocked laser light (column 8 line 28+).

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Regarding claim 4, Ross teaches a scanner for scanning the laser light across the surface of the article from the portion of the surface to another portion of the surface (51, figure 4).

Regarding claim 5, Ross teaches that the scanner is for focusing the laser light to a spot and rapidly scanning the spot across the surface of the article (column 8 line 28+).

Regarding claim 6, Ross teaches that the scanner is for focusing the laser light to a line (column 8 line 28+).

Regarding claim 7, Ross teaches that the first and second detectors comprise a linear detector array comprising semiconductor detectors (figure 8).

Regarding claim 9, Ross teaches that the second detector is for detecting Raman scattering from the portion of the surface (abstract).

Regarding claim 10, Ross teaches that the second detector is for detecting second harmonic generation (abstract).

Regarding claim 11, Ross teaches that the first and second detectors comprise photo-multipliers (column 8 line 28+).

Regarding claim 12, Ross teaches that a separator (34) disposed between the surface of the article and the first and second detectors, for separating the light from the portion of the surface at the incident wavelength from the light at the other wavelength and directing the light to the first and second detectors (figure 1).

Regarding claim 13, Ross teaches that the separator comprises a diffraction grating (34).

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Regarding claim 14, Ross teaches that the separator comprises a cylindrical lens (34).

Regarding claim 15, Ross teaches that the separator comprises a bandpass filter (grating, 34).

Regarding claim 16, Ross teaches that the separator comprises a focusing lens (32).

Regarding claim 20, Ross teaches that the processor is configured to generate a defect map of the surface of the article (column 8 line 28+).

Regarding claim 23, Ross teaches that scanning the light beam across the surface of the article from the portion of the surface to another portion of the surface (figure 1).

Regarding claim 24, Ross teaches that focusing the light beam to a spot and rapidly scanning the spot across the surface of the article (figure 1).

Regarding claim 25, Ross teaches that focusing the light beam to a line (figure 1).

Regarding claim 27, Ross teaches that detecting Raman scattering from the portion of the surface with the second detector (column 8 line 18+).

Regarding claim 28, Ross teaches that detecting second harmonic generation from the portion of the surface with the second detector (abstract).

Regarding claim 29, Ross teaches that separating the light from the portion of the surface at the incident wavelength from the light at the other wavelength and directing the light to the first and second detectors (figure 1).

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Claims 1-7, 9-12, 15-23 and 30-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Takeda et al. (US 5936726).

Regarding claims 1, 21-22, Takeda teaches an apparatus for inspecting a surface of an article, the apparatus comprising:

- a light source (1) for irradiating a portion of the surface of the article with a light beam at an incident wavelength;

- a first detector (10) for receiving light at the incident wavelength from the portion of the surface and generating a first signal;

- a second detector (9) for receiving light at a wavelength different from the incident wavelength from the portion of the surface and generating a second signal; and

- a processor configured for determining, based on the first and second signals, whether a defect exists on the portion of the surface (column 15 line 15+).

Regarding claim 2, Takeda teaches that the light source is a laser for producing laser light at the incident wavelength (column 15 line 15+).

Regarding claim 3, Takeda teaches that the laser provides continuous wave laser light (column 15 line 15+).

Regarding claim 4, Takeda teaches a scanner for scanning the laser light across the surface of the article from the portion of the surface to another portion of the surface (51, figure 4).

Regarding claim 5, Takeda teaches that the scanner is for focusing the laser light to a spot and rapidly scanning the spot across the surface of the article (figure 14).

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Regarding claim 6, Takeda teaches that the scanner is for focusing the laser light to a line (figure 14).

Regarding claim 7, Takeda teaches that the first and second detectors comprise a linear detector array comprising semiconductor detectors (well known).

Regarding claim 9, Takeda teaches that the second detector is for detecting Raman scattering from the portion of the surface (abstract).

Regarding claim 10, Takeda teaches that the second detector is for detecting second harmonic generation (different angle, abstract).

Regarding claim 11, Takeda teaches that the first and second detectors comprise photo-multipliers (column 15 line 15+).

Regarding claim 12, Takeda teaches that a separator (6) disposed between the surface of the article and the first and second detectors, for separating the light from the portion of the surface at the incident wavelength from the light at the other wavelength and directing the light to the first and second detectors (figure 15).

Regarding claim 15, Takeda teaches that the separator comprises a bandpass filter (6).

Regarding claim 16, Takeda teaches that the separator comprises a focusing lens (5).

Regarding claim 17, Takeda teaches that the separator comprises a plurality of dichroic mirrors (6).

Regarding claim 18, Takeda teaches that an objective lens (3) between the light source and the surface of the article.

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Regarding claim 19, Takeda teaches that the objective lens is for passing the light from the portion of the surface of the article to the separator (figure 15).

Regarding claim 20, Takeda teaches that the processor is configured to generate a defect map of the surface of the article (abstract).

Regarding claim 23, Takeda teaches that scanning the light beam across the surface of the article from the portion of the surface to another portion of the surface (figure 15).

Regarding claim 30-32, Takeda teaches that irradiating a portion of a reference surface corresponding to the portion of the surface of the article with a light beam at the incident wavelength; receiving light at the incident wavelength from the portion of the reference surface at the first detector to generate a third signal; and receiving light at a wavelength different from the incident wavelength from the portion of the reference surface at the second detector to generate a fourth signal; wherein the determining step comprises determining whether the defect exists further based on the third and fourth signals (column 16 line 1+).

Regarding claim 33, Takeda teaches that the determining step comprises determining the defect exists when the second signal is a predetermined value, the predetermined value corresponding to a particular wavelength other than the incident wavelength (figure 24).

Regarding claim 34, Takeda teaches that classifying the defect into a predetermined category when the second signal is the predetermined value (figure 24).

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ross in view of Kohno (US 5399867).

Ross fails to teach that the second detector is for detecting fluorescence from the portion of the surface.

Kohno teaches foreign particle inspection apparatus using fluorescent analysis (abstract).

In view of Kohno, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to adopt the fluorescent light detection system in order to securely detect the presence and position of a foreign particle without misdetection due to readherence of dust or the like (column 2 line 5+). Accordingly, one would be motivated to adopt the fluorescent light detection system because it would provide more precise inspection of the surface of the wafer.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon K Song whose telephone number is 703-308-2736. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-4858 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Hoon K. Song
March 3, 2003


ROBERT KIM
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